process to reduce oxidation. The blender may be insulated depending upon the flavor material to be plated. The mixing process in a blender takes about 10 to 30 minutes according to predetermined loading level of lemon oil, other flavors, or other liquid materials that are sensitive to oxygen and/or elevated temperatures. The plated lemon oil, which is now a mix of solid particles, is in turn discharged into an encapsulation vessel that can be closed and blanketed with nitrogen or other inert gas.

When the encapsulation process begins, the plated lemon oil is gradually heated to the range between 60° to 150° F. in the encapsulation vessel. Melted coating is sprayed into the encapsulation vessel containing plated lemon oil when the batch temperature reaches the target point. Spraying of melting coating stops at the predetermined level of coating, depending upon degree of protection needed for lemon oil or other flavors. The finished product, e.g., encapsulated lemon oil, is then discharged from the encapsulation vessel, screened to appropriate particle size and packaged.

It will be apparent to those skilled in the art that various modifications and variations can be made in the compositions and methods of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A method of encapsulating a sensitive material comprising:

plating the sensitive material onto a solid carrier, in an atmosphere inert to the sensitive material, to form a plated material; and

encapsulating the plated material.

2. The method of claim 1 wherein the atmosphere inert to the sensitive material is nitrogen, carbon dioxide, or helium.

3. The method of claim 1 wherein the solid carrier is chilled prior to plating with the sensitive material.

4. The method of claim 3 wherein the solid carrier is chilled by liquid nitrogen.

5. The method of claim 1 wherein the solid carrier is porous or semi porous.

6. The method of claim 5 wherein the solid carrier is maltodextrin, silicon dioxide, starches and starch derivatives, gums, or hydrocolloids.

7. The method of claim 6 wherein the encapsulation occurs in an atmosphere inert to the sensitive material.

8. The method of claim 7 wherein the atmosphere inert to the sensitive material is oxygen-free.

9. The method of claim 7 wherein the atmosphere inert to the sensitive material is nitrogen, carbon dioxide, or helium.

10. The method of claim 1 wherein the sensitive material has a boiling point of between about 40° F. and 250° F.

11. The method of claim 1 wherein the atmosphere inert to the sensitive material is oxygen-free.

12. The method of claim 1 wherein the sensitive material is sprayed onto the solid carrier.

13. The method of claim 1 further comprising encapsulating the plated material with a melted encapsulant.

14. The method of claim 1 wherein the percentage of encapsulant in the resulting encapsulated particles is between about 10 to about 90%.

15. The method of claim 14 wherein the percentage of encapsulant in the resulting encapsulated particles is between about 20 to about 80%.

16. The method of claim 1 wherein the sensitive material is a volatile material.

17. The method of claim 1 wherein the sensitive material is an oxygen sensitive material.

18. The method of claim 1 wherein the sensitive material is a biologically active substance.

19. The method of claim 18 wherein the biologically active substance is selected from the group consisting of Lactobacilli, Bifidobacterium, Enterococci phytase, amylases, lipases, invertases, transglutaminases, proteases, lipoxygenases and pentosanases.

20. The method of claim 1 wherein the sensitive material is at least one selected from the group consisting of alcohols, acetones, ketones, aldehydes, organic acids, and antioxidants.

* * * * *